



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

Applicant: Manabu Ohta, et al.
Application: DEVICE AND METHOD FOR DETERMINING RARE SHORT CIRCUIT
Serial No. : 09/944,689⁶⁹⁸
Filing Date: August 31, 2001
Art Unit: 2836
Case: 0154/01025

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AMENDMENT-REMARKS

Dear Sir:

The following remarks are presented in response to the Official Action mailed on October 6, 2003, concerning the above-identified application.

Claims 1, 2, and 8 have been rejected under 35 U.S.C. 102(e) as being anticipated by Mizuno et al (US 6,011,416). Claims 3 - 7, 9, and 10 have been rejected under 35 U.S.C. 103(e) as being unpatentable over Mizuno et al (US 6,011,416) in view of Deb (U.S. 5,933,355)

In response to the Official Action, claims 1-7 have been amended, claims 8-10 have been canceled, and claims 11-13 have been added. Support for the amendments can be found throughout the application, but see specifically page 5, lines 13 -16. New claim 11 is supported by the specification at page 6, lines 16-22. New claims 12 and 13

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are supported by the specification at page 8, lines 22-27. No new matter has been added. Claims 1-7 and 11-13 are now pending in the present application.

The drawing, FIG. 3, has been amended to correct a typographical error.

Applicant submits that the aforementioned amendments to the claims and the drawing now place the application in condition for allowance. Said allowance is respectfully solicited.

The Applicant's Invention:

The present invention is directed to a blade fuse element 50 that is capable of determining whether a rare short circuit has occurred in a load circuit 5. As shown in Figs. 2A and 2B, the blade fuse element 50 includes a fuse portion 2 which melts and breaks when a dead short circuit is likely to occur in the load circuit 5. The blade fuse element 50 includes a determining circuit connected to the fuse portion for determining whether a rare short circuit has occurred, wherein the determination circuit calculates one of a first parameter and a second parameter every predetermined time interval based on the detection signal, the first parameter relating to a first time period during which the load current exceeds a predetermined reference current value, and the second parameter relating to a second time period during which the load current is less than or equal to the predetermined reference current value, wherein the determining circuit cumulates the calculated one of the parameters every predetermined time interval to calculate a cumulative parameter value and determines whether a rare short circuit has occurred based on the cumulative parameter value. The predetermined time is shorter than a time during a rush current is produced and, typically, the predetermined time is 1 millisecond. The load current, which flows through the load circuit and is detected based on a potential difference V at the fuse portion 2. Accordingly, the fuse portion 2 serves as a current sensor.

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Mizuno Does Not Anticipate
the Present Invention.

Claims 1-2 and 8 are rejected under 35 U.S.C. §102(e) as being anticipated by Mizuno et al., (US 6,011,416). Applicants submit that in the instant amendment to claim 1 further differentiates the invention from Mizuno.

Mizuno discloses a switch circuit rather than the now claimed blade fuse, which serves as a current sensor. In fact Mizuno teaches away from using fuses as a primary component, to wit:

“...short circuits include a state in which an excess current flows continuously and a state in which pulse-like excess currents intermittently flow. IN the latter case, the heat accumulation ratio is reduced as compared with the former case. Therefore, there arises apprehension that the melting time is elongated or the fuse cannot be melted though an excess current is flowing. Thus, devices and electric lines cannot reliably be protect by using the fuse from intermittent pulse-like currents.” Column 1, lines 54-62.

For the above stated reason alone, Applicant's submit that Mizuno is not an appropriate 102(e) reference.

Separately, however, Mizuno is not applicable inasmuch as it requires the circuit to be shut down even when the net heat flow into the circuit is not such as to require that the circuit be shut down. Specifically, Mizuno utilizes a microcomputer to determine whether the load current I_L is larger than a reference current I_{ref} and, when so, it measures the time T_S during which there is such a load current. When the product $I_L \times T_S$ exceeds a predetermined value S , the current is shut off. In contrast, the present invention computes an algebraic sum of [current departure (positive or negative) from the reference current] X [time the departure lasts], in effect averaging out these departures. The present invention shuts down the circuit only when said algebraic sum is above a predetermined value. Thus (1) Mizuno detects the possibility of overload in a different way; and

(2) Mizuno fails to account for when IL is less than Iref, shutting down the circuit even when the total heat generated is less than that requiring a shutdown.

Mizuno and Deb Do Not Suggest
the Now-claimed Invention

Claims 3-4, 6, 9-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mizuno et al in view of Deb (U.S. 5,933,355). Applicants submit that in light of the foregoing amendment and the argument traversing Mizuno, the instant 103 rejection is obviated.

Furthermore, Applicants submit that no incentive exists to combine Mizuno and Deb. This is because Deb's objective is "predicting hourly values of power line ampacity of a power transmission line system up to seven days in advance, using results obtained from said analysis." See Claim 1. Deb does not address the real-time detection of short circuits, as is claimed, while the present invention measures the current typically every millisecond and assesses the situation at the end of that millisecond.

Mizuno deals with immediate circuit protection. Deb deals with current volume, hours or days in advance. "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." ACS Hospital Systems Inc., v. Montefiore Hospital, 732 F. 2d 1572.

In light of the foregoing, Applicants submit that the combination of Mizuno and Debs is impermissible hindsight. Withdrawal of the 103 rejection and allowance of claims 3-4, and 6, is respectfully requested.

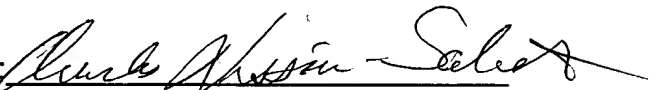
An earnest attempt has been made hereby to fully respond to the §102 and §103 rejections contained in the October 6, 2003, Official Action for the above-identified matter. All claims are deemed in proper form and scope for allowance. If the Examiner feels that a telephonic interview will expedite allow-

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ance of the instant application, he is respectfully urged to call the undersigned.
Reconsideration and allowance of claims 1-7, and consideration and allowance
of newly added claims 11-13 is hereby solicited.

Respectfully submitted,

CHERSKOV & FLAYNIK

By: 

Charles Nissim-Sabat (Reg No.: 42,037)

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